

initial and final *s* were quite lost, and the action of the mutes, *c*, *t*, was almost *nil*.

The invention is highly interesting, the effects at present produced are sometimes startling (as in cries, coughs, laughter, music), the philosophy of the process (taking a permanent impression of a very complex compound vibration, and using it as a mould to reproduce that vibration) is exceedingly attractive, but at present the instrument—at least that one which I saw, differing in many respects from the one described by Prof. Mayer—has not risen beyond a lecture illustration or a philosophical toy.

ALEXANDER J. ELLIS

April 13

Phonetic Representation of Vowels and Diphthongs

PERHAPS your correspondent, Mr. Sedley Taylor, would kindly test with his phoneticoscope the propriety of calling the English combinations *ea*, *ae*, *oe*, *ie* diphthongs, and the simple vowel *i*, as pronounced in the personal pronoun, a simple sound. Perhaps also the English *ā* (as in "*name*") may be regarded as a diphthong. In Otto's German Grammar, the German combinations *ae*, *oe*, *ue*, are classed as modified vowels. I fancy *ee* is a diphthong, though in rapid speech it becomes more like the simple sound *ue*.

J. H. BLAKESLEY

Linden, Hannover, April 11

The Acoustical Properties of Soap Films.

IN connection with the interesting results recently obtained by Mr. Sedley Taylor upon the acoustic properties of soap-films, as exhibited in the simple and beautiful instrument which he has termed the Phoneticoscope, I should like to call attention to the following passage published in 1873 by Prof. E. Mach, of Prague, in his *Optisch-Akustische Versuche*:—

"Bei dieser Gelegenheit kann erwähnt werden, dass die Plateauschen Flüssigkeitshäutchen sich vorzüglich zum Studium der Membranschwingungen eignen. Eine solche Flüssigkeitshaut vor eine tönende Pfeife gebracht zeigt meist mehrere Bäuche. Ein Lichtpunkt, der sich in der Membran spiegelt, gibt mehrere glänzende geschlossene Curven."

After some remarks on the low tones to which these films vibrate, and on their vibrations to the upper partial tones, the author passes on to another subject with the remark:—"Ich erwähne diese Experimente, weil sie vielleicht, weiter verfolgt, zur Beantwortung mancher Fragen über Membranschwingungen beitragen können."

There is no mention, however, of the rotating pairs of coloured vortices noticed by Mr. Sedley Taylor. Brewster appears to have observed similar phenomena (see *Edin. Trans.*, vol. xxiv, "On Colours of Soap Bubbles," &c.) as the result of directed currents of air upon films. I have found that the vortices are also produced when a small lightly vibrating tuning-fork, having its prongs previously wetted with soap solution, is made to touch a flat soap film produced in the ordinary manner.

SILVANUS P. THOMPSON

University College, Bristol, April 5

Cumulative Temperature

THE idea of a clock with an uncompensated pendulum for temperature integration referred to by Mr. Cooke (*NATURE*, vol. xvii. p. 323 and p. 448) has probably occurred to many persons, and was proposed by me in 1840; I found, however, that it was not new then. Forbes says in his Report on Meteorology (Brit. Assoc. Report, 1832, p. 213):—"A mechanical mode of taking the mean of an infinite number of temperatures has been proposed by M. Grassman, by observing the change of rate caused by the influence of temperature upon the uncompensated pendulum of a clock (*Poggendorff*, 1825). The idea is a good one, but was proposed long ago by Dr. Brewster ('Edinburgh Encyclopædia,' art. Atmospheric Clock)." The chief merit in this matter will belong to the person who puts the idea into a working form which can be proved capable of giving accurate results.

April 9

B.

The Southern Drought

IN response to your question appended to my letter in the last number of *NATURE*, I am able to give you the time of the

last great drought in the Gilbert Islands. In 1870 I visited these and several other islands in the South Pacific (an account of my cruise appeared in Dr. Petermann's *Mittheilungen* for June, 1871), and at that time there was a very general drought. I was among the Gilbert Islands during October, and found that no rain had fallen there for several months. The cocoa-nut and pandanus-trees, upon which the people almost entirely depend for food, were very much dried up, and the fruit upon them were small, both in quantity and in size. This drought continued for two years after my visit, and the famine became so severe that many of the people were starved to death. Had it not been for the fish they procured, it is doubtful whether any of them would have survived, for the cocoa-nut and pandanus-trees ceased to yield fruit, and the poor people were obliged to chew the roots of the trees.

Since that time I have heard of another season during which there was little rain, in consequence of which there was comparative scarcity, but this was not to be compared with the great drought of 1870-1872.

I regret to say no long-continued observations on the rainfall have been made in Samoa. My own time was so fully occupied with other matters, during my residence there, that I neglected this one. As the droughts there have not been great enough to cause anything like distress, the periods of their occurrence have, unfortunately, not been recorded.

S. J. WHITMEE

Blackheath, April 5

Research in Libraries

BEFORE this "voice from Australia" can reach London, I hope that some steps will have been taken towards carrying out Dr. Mallet's valuable suggestion (*NATURE*, vol. xvi. p. 457) so far as regards the British Museum and other leading European libraries.

The benefit of the proposed arrangement would, I am sure, be felt in Australia as much as in America. Anybody living here, in the North of Queensland, who may wish to consult a scientific book must take a sea voyage of 700 or 1,100 miles at a cost of 16*l.* or 20*l.* in money and at least a fortnight or three weeks in time. It may happen that one has a busy friend in the library city who will undertake the search through good-nature, but most people would prefer to employ a competent man who would do so as a matter of business.

Should the trustees or directors of the great libraries hesitate (and they may) to accept the responsibility of recommending searchers, probably it would answer nearly as well if the searchers were to advertise references to well-known scientific or literary men. Perhaps a hint might be taken from the Register House in Edinburgh. Titles to land in Scotland require registration for their completion. A purchaser, to satisfy himself that the seller has not previously alienated or burdened the subjects, has to overhaul the books of the register. This is done for him as a rule by professional searchers, some of whom are official and some unofficial. The system has worked admirably for some centuries I believe. Any Scotch lawyer could explain its details.

The subdivision of labour suggested by Dr. Mallet would enable a much higher use to be made of the system than the mere hunting-up of references. For example, if there were a searcher in Paris—a well-read geologist—to whom I could intrust an order for "any references in French geographical works bearing on the date of the erosion of the terrace between the Queensland coast range and the Pacific," or some such information, what possibilities would open out to the dwellers in distant isles, nay, even to the comparatively privileged inhabitants of London itself?

ROBERT L. JACK

Geological Survey Office, Townsville, Queensland, Jan. 14

Mimicry in Birds

WITH reference to the correspondence on this subject which has recently appeared in *NATURE*, may I add the following instance, which has fallen under my own observation?—

On the coast of Kent is a tract of land protected from the sea by an embankment of shingle, and known as the "Reculver Marsh." It is frequented by skylarks and ring-plovers. Almost all these larks have incorporated the well-known alarm note of the plovers into their song. With such distinctness is this double note brought in, that the first time I heard it I could with difficulty convince myself that it was not uttered by *Agialitis hiaticula*.

In the surrounding district, where larks are equally numerous, I have never detected the peculiar note.

This power of imitating the songs of birds is well known to bird-fanciers and dealers; hence birds taken from the nest are considered worthless by those who admire the natural song. I myself had a Siskin that sang the goldfinch's song, and a muthatch that I sent to a bird show came back with a wonderful medley of notes, of which he seemed extremely proud, the call-note of the canary and several notes of the blackbird being amongst those I could clearly recognise.

J. YOUNG

Notting Hill

Harrow School Bathing-Place

WILL you kindly allow me to appeal through your columns for suggestions how to cure a nuisance which we suffer from year after year in our bathing-place here, and for which we have as yet found no remedy?

The water which is pumped into the bath from a considerable depth is beautifully clear at the beginning of the season, but as soon as the weather becomes hot and the rays of the sun attain power, countless filaments, consisting of confervæ, &c., spring up from the brick floor of the bath, and push their way rapidly to the surface, the depth of the water varying from about four feet to six feet. As the boys plunge from the side into the water and swim about the bath these long wavy stems are shivered into myriads of fragments, which collect on the surface of the water and form there a disagreeable and ugly scum, which detracts not a little from the pleasure of bathing during a great part of the summer term. We have taken some pains to discover a remedy for this, whether by chemical or other means, but as yet have been quite unsuccessful. The weed reappears in equal exuberance year after year and we are helpless. If any of your readers can contribute to the removal of this annual plague, he would confer a great benefit on the school, and any practical suggestions would be gratefully received either by G. Griffith, Esq., Harrow, or by

ARTHUR G. WATSON

Harrow, April 8

London Clay Fossils

I SHOULD be glad if any of the contributors to NATURE would kindly inform me of any fossiliferous sections of the London clay at present open in the immediate neighbourhood of London. Many of those named in Whitaker's "Geology of London," such as Highgate, Hampstead Heath, &c., are closed, while others at Lewisham, &c., yield no fossils except a few fragments of wood.

HERMANN H. HOFFERT

South Kensington Science Schools, April 15

Meteor

As the meteor of April 2 was seen at Ashwell, Herts, and with much the same course and splendour as observed at Leicester (but without any accompanying sound), it must have been very much further off than your Leicester correspondent imagines.

So bright a meteor, falling so early in the evening, cannot fail to have been much observed.

H. GEORGE FORDHAM

Odsey Grange, Royston, Herts

The Nightingale

IN case you have received no earlier communication to a similar effect, you may possibly think it worth while to record that I heard a nightingale twice on the 14th instant, in a plantation by the side of Hanger Lane, in Ealing. It was but an abortive song, such as the first of the season is very apt to be, as if he were rather shy of the sound of his own voice. But there was enough of it to leave no possible doubt as to the identity of the performer. I may add that I have in previous years heard him in the same spot two or three days earlier than elsewhere in this neighbourhood.

I heard the wryneck ("cuckoo's mate") also several times on the same day in Gunnersbury and Hanger Lanes, having heard him once the previous afternoon (13th) in Kew Gardens.

Gunnersbury, April 16

G. J. PEARSE

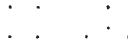
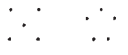


FLOATING MAGNETS¹

FOR one of my little books of the Experimental Science Series I have devised a system of experiments which illustrate the action of atomic forces, and the atomic arrangement in molecules, in so pleasing a manner that I think these experiments should be known to those interested in the study and teaching of physics.

A dozen or more of No. 5 or 6 sewing needles are magnetised with their points of the same polarity, say north. Each needle is run into a small cork, $\frac{1}{4}$ in. long and $\frac{3}{8}$ in. in diameter, which is of such size that it just floats the needle in an upright position. The eye end of the needle just comes through the top of the cork.

Float three of these vertical magnetic needles in a bowl of water, and then slowly bring down over them the N. pole of a rather large cylindrical magnet. The mutually repellent needles at once approach each other and finally arrange themselves at the vertices of an equilateral triangle, thus . . . The needles come nearer together or go further away as the magnet above them approaches them or is removed from them. Vibrations of the magnet up and down cause the needles to vibrate, the triangle formed by them alternately increasing and diminishing in size.

On lifting the magnet vertically to a distance, the needles mutually repel and end by taking up positions at the vertices of a triangle inscribed to the bowl.

Four floating needles take these two forms	
Five " " "	
Six " " "	
Seven " " "	

I have obtained the figures up to the combination of twenty floating needles. Some of these forms are stable; others are unstable, and are sent into the stable forms by vibration.

These experiments can be varied without end. It is certainly interesting to see the mutual effect of two or more vibrating systems, each ruled more or less by the motions of its own superposed magnet; to witness the deformations and decompositions of one molecular arrangement by the vibrations of a neighbouring group, to note the changes in form which take place when a larger magnet enters the combination, and to see the deformation of groups produced by the side action of a magnet placed near the bowl.

In the vertical lantern these exhibitions are suggestive of much thought to the student. Of course they are merely suggestions and illustrations of molecular actions and forms, for they exhibit only the results of actions in a plane; so the student should be careful how he draws conclusions from them as to the grouping and mutual actions of molecules in space.

I will here add that I use needles floating vertically and horizontally in water as delicate and mobile indicators of magnetic actions, such as the determination of the position of the poles in magnets, and the displacement of the lines of magnetic force during inductive action on plates of metal, at rest and in motion.

The vibratory motions in the lines of force in the Bell telephone have been studied from the motions of a needle (floating vertically under the pole of the magnet), caused by moving to and fro through determined distances, the

¹ A note on Experiments with Floating Magnets, by Alfred M. Mayer. Reprinted from the *American Journal of Science*.